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ABSTRACT

Information is provided about the use of telecommunications in the delivery of postsecondary coursework to off-campus nonmetropolitan sites in the Mountain Plains states. The five chapters cover the following: introduction; review of the literature (shift to information society, underserved rural adult population, historical sketch, selected telecommunications systems, medium is not the message, and questions of evaluation); procedures; findings; and conclusions/recommendations. Topics reported include informational technologies used, the extent of use and application, the variety of clients and communities served, operational costs, faculty involvement and incentives, evaluation methods, services most needed, and future plans. Some of the many conclusions reached are: a very small group of potential distance learners in the Mountain Plains states are being served via telecommunications; further research into the issue of how to involve and motivate faculty to participate in telecommunications delivery is necessary; and statewide or regional incentives for innovation in the telecommunications field should be initiated by professional adult education groups. Nine appendices are as follows: Jonsen letter; National Technological University; Spencer model; cover letter to survey; survey instrument; respondents excluded; faculty incentives; 5-year plans; and directory of officials responding. Contains 42 references. (SM)

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Mountain Plains Telecommunications: 1987 Survey of Colleges Serving Nonmetropolitan Distance Learners

Marjorie Hacker Slotten

Colorado State University

Occupational and Educational Studies

November, 1987

Submitted in Partial Fulfillment of Requirements for

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ABSTRACT

This research gathered information about the use of telecommunications in the delivery of postsecondary coursework to off-campus nonmetropolitan sites in the Mountain Plains states: Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming. Data from 41 of 49 institutions surveyed, show:

1. A total of 24,452 students participated in a total of 1,261 courses via telecommunications during the past two academic years.

2. Twenty-two institutions delivered coursework via telecommunications to nonmetropolitan sites, five delivered to metropolitan areas only, 13 schools did no off-campus delivery, and one institution beamed via satellite only to off-campus learners.

3. Over 90 percent of responding officials expressed interest in an information exchange for evaluating telecommunications delivery.

4. Services most needed were: sharing information, training faculty and staff, and establishing a regional information network.

The study concluded that a need exists for publishing the data and for further study of the faculty training and incentive issue.

ACKNOWLEDGEMENTS

The road to a master's degree in adult education when you live in Twin Falls, Idaho could be very lonely. Thanks to the encouragement and assistance of many, it appears that the goal for this adult nonmetropolitan learner is near.

Sincere thanks to the following individuals for helping to make this possible:

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CHAPTER ONE: INTRODUCTION

Purpose

The purpose of this research project was to gather information about instructional information technologies which are being used for the delivery of postsecondary coursework to off-campus locations throughout the seven Mountain Plains states. The intent was to determine which technologies are being used, extent of use, variety of clients and communities served, costs, faculty involvement, evaluation methods used, and future plans. If responding institutions indicate an interest in sharing information, efforts will be made to meet that expressed interest.

Although focused on discovering how the learning needs of adults are being met through telecommunications in nonmetropolitan areas, it is hoped that results of this research will be useful to educational planners and administrators when they are asked to make decisions about the use of technologies in distance education.

Situation

In the Mountain Plains states, there are few metropolitan areas; since most of the population is scattered in rural areas and cities of under 50,000 population. In fact, the entire area has just 23 cities classified as metropolitan with populations over 50,000 and seven of them are located in Colorado. Phoenix and Denver are the only two cities with over one million residents. Not surprisingly, most of the educational institutions in the region are located in these 23 cities.

According to Bruce O. Barker of Texas Tech University's National Center for Small Schools, "Rural learners who live in areas of low population density and/or geographic isolation will most definitely be provided fewer educational services and opportunities." Barker goes on to say that rural America includes over one-fourth of the U.S. population and that ". . . rural citizens are still disadvantaged in comparison to their urban and suburban counterparts" (Barker, 1985, p. 5, 7).

In order to meet the needs of distant learners, many institutions are exploring the use of telecommunications, which has become a widely-accepted method of reaching off-campus learners. However, specific information about the variety of systems and technologies is often difficult to find when administrators are asked to make decisions for their institutions.

In a 1985 survey undertaken by the Western Interstate Commission for Higher Education (WICHE), 344 of the 575 public and private institutions in the 13 Western states responded to their use of instructional applications of information technologies (Lewis and Markwood, 1985, p.1). Participating states were Alaska, California, Hawaii, Montana, Oregon, and Washington; in addition to the seven Mountain Plains states of Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming. Eighty-six institutions in the Mountain States responded out of a total of 130 considered eligible to respond. Results indicated that 13 percent of the responding institutions were

using information technologies to reach rural adult learners in off-campus settings. Regarding potential collaboration, the WICHE report showed that, "Ninety-seven percent rate information-sharing as an important collaborative activity, and networking with colleagues about instructional application of information technologies is considered important by 88 percent" (Lewis and Markwood, 1985, p. 8).

Problem Statement

Lack of concise information about the use of telecommunications in higher education is a problem for Mountain Plains administrators who are asked to make decisions about initiating or implementing or modifying instructional technologies at their separate institutions. Since most institutions are enrollment-driven for funding, expansion of off-campus programs is often seen as required, as well as desired. Distance education is currently accomplished in a variety of ways, including independent study by correspondence and faculty traveling to teach at remote sites. The addition of telecommunications delivery of coursework has the potential to reach an expanded audience of distant learners.

Therefore, if coursework delivery via telecommunications becomes a desired option for institutions, it is hoped that results of this research will provide an information base for institutions of higher education. If responding institutions express interest in sharing and collaborating, this researcher hopes to find the necessary

assistance for making results of this study available throughout the Mountain Plains states.

Problem Rationale

For distance education, the learners' needs determine the use of media, and the media must be suited to the educational message, comments Michael G. Moore, in The American Journal of Distance Education. Moore continues, "While it is essential that adult and college educators become users, not opposers, of modern communications media, it is also highly desirable that they avoid single medium fixations" (Moore, 1987, p. 3).

According to 1986 figures, the total population of the seven Mountain Plains states is 10,586,095 (The World Almanac and Book of Facts, 1985). If Barker's estimate that one-fourth of the population lives in rural areas holds true in the Mountain Plains states, there could be as many as 2,646,524 rural residents in the area. If one-fourth of this population could be characterized as potential adult learners, Mountain Plains educators could expect to serve 661,631 residents via distance delivery methods. With the demands of the Information Age just as real in rural areas as in metropolitan areas, telecommunications links could help meet the lifelong learning needs of the rural adults who have chosen to live outside of metropolitan areas.

Procedures

A decision was made to send a questionnaire to all institutions

in the Mountain Plains states that had reported using instructional technologies in a previous WICHE survey. This researcher also consulted with officers and members of the Mountain Plains Adult Education Association to prepare a mailing list that contained all Mountain Plains institutions which were involved in telecommunications delivery. A survey questionnnaire was prepared and pretested by experienced professionals in the field of adult education and telecommunications delivery. After revisions, the survey was mailed to 64 college and university officials in 49 Mountain Plains institutions of higher education. A follow-up request for information was mailed to these same potential respondents 10 days later. It was accompanied by a letter signed by WICHE Deputy Director Richard W. Jonsen, indicating that WICHE would be most interested in results of the survey and also expressing his interest in forming a Western Regional Telecommunications Cooperative (see Appendix A, Jonsen Letter).

Research Objectives

The objectives of this research were:

1. To discover what current programs and delivery systems exist that make use of educational telecommunications to deliver instruction in nonmetropolitan areas of the Mountain Plains states.

2. To determine if survey respondents were interested in sharing information among themselves and collaborating on a regional basis in the telecommunications field.

3. To assess the extent of faculty involvement and the use of faculty incentives to promote telecommunications efforts in Mountain Plains institutions of higher education.

4. To find out what types of evaluation methods were being used in telecommunications delivery in the Mountain Plains area and to discover if administrators of telecommunications programs would be interested in and willing to pay a fee for a telecommunications evaluation network.

Limitations

Limitations of this research project included choosing to survey only institutions of higher education in the Mountain Plains states and the difficulty of synthesizing their data into a possible format for dissemination. A delimitation was established in the decision to define "nonmetropolitan" as areas containing fewer than 50,000 residents. Other limiting factors included the partially-completed questionnaires received, personal interpretation of telephone conversations, and tabulation of open-ended questions.

Definitions

For purposes of this research, the following definitions were used:

Mountain Plains States - Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming.

Distance education - describes teaching/learning relationships in which the participants are usually geographically separated and

communication is through telecommunications.

Instructional information technology or Telecommunications - terms may be used interchangeably and refer to technologies including, but not limited to: video, audio, computer, public television, public radio, telephone, satellite, I.T.F.S. (defined below), or any combination, either interactive or non-interactive.

I.T.F.S. - Instructional Television Fixed Service - refers to the block of television channels, operating at microwave frequencies, that have been reserved by the Federal Communications Commission for educational purposes and have local (25-mile radius) one-way capabilities.

Nonmetropolitan - defined by the U.S. Bureau of the Census as any city or area with fewer than 50,000 residents.

CHAPTER TWO: REVIEW OF THE LITERATURE

Shift to Information Society

In reviewing the literature on distance education, telecommunications, and rural off-campus delivery systems, this researcher found many reports and documents that gave a firm research base for this phase of adult education. It is the researcher's opinion that if residents in nonmetropolitan settings are to have the privilege and advantage of being adult learners, telecommunications may be one key to the future as the nation moves to the information society.

In 1982 the Carnegie Commission on Higher Education predicted that, ". . . by the year 2000 over 80 percent of off-campus instruction . . . will use information technology" (Urbanowicz, Wright & Meuter, 1986, p. 8).

John Naisbitt in Megatrends points out the shift to an information society with more people employed in universities than in agriculture and he claims that ". . . the strategic resource is information" (Naisbitt, 1982, p. 42). A followup book by The Naisbitt Group states:

> Hundreds of thousands of adults will return to school via electronic university programs designed for home computers, cable television, or work-site educational extension programs. The age of electronic education is upon us. . . . While the technology exists to allow us to go from preschool to

> postgraduate work without ever leaving our living rooms, it isn't likely that any of us will opt for that route. Technology just widens our options. (Naisbitt, 1984, p. 23, 27)

At the eighth annual conference of the Pacific Telecommunications Council, one presentation read:

> Individuals of this planet no longer live in isolation; we all co-exist in an increasingly integrated information environment. The geographically separated inhabitants of the globe are woven together into an 'information society' that is, in fact making the world a smaller place. (Urbanowicz et al., 1986, p. 5)

Underserved Rural Adult Population

Bruce O. Barker pointed out that, based on the Census Bureau's definition, 59.5 million people, or 28.8 percent of the U. S. population live in rural settings. "This definition implies that rural America collectively consists of all of our society's nonmetropolitan areas," Barker asserted. He went on to say that information on adult education programs for rural Americans is, ". . . both incomplete and inadequate" (Barker, 1985, p. 5).

"Where two or three are gathered," according to Robert H. Boyd, characterizes rural settings and also symbolizes the importance we need to assign all lifelong learners (Boyd, 1983, p. 21). Boyd also says, "It is a serious mistake to assume that the present-day unserved and underserved rural populations are also uneducated . . ." He goes on to dispute five "excuses" why adult learners in rural areas

are so often underserved and says, "I suggest that there is something inherently wrong with the suggestion that the availability of continuing education opportunity should be based more on where you live in your state than on need" (Boyd, 1983, p. 26).

The Action Agenda Project, which grew out of a landmark national meeting on rural postsecondary education in Kansas City in 1981, speaks to the rural adult education problem. In a report, Spears and Mais state, "Seen through the lens of lifelong learning, rural adults are a segment of the population isolated by virtue of distance or topography from the educational services they will continue to demand throughout their lifetimes" (Spears and Maes, 1985, p. 10).

It was 1973 when Malcolm Knowles, in a book about adult learners, said:

> In no dimension of education have there been more explosive developments in recent times than in educational media - closed circuit television, videotape and portable videotape machines, cassette audiotapes, technimation, teaching machines, multimedia systems consoles, a variety of information retrieval systems, amplified telephone (for telelectures), learning center systems, language laboratories, computer-assisted instruction, and commercially produced simulations and games. . . The important thing is not that these resources are available but that learners use them proactively rather than reactively. . . . (Knowles, 1973, p. 105)

Knowles' list of educational media has grown to ever-increasing possibilities, including satellite, and the literature on instructional information technologies suggests the link between the needs of rural adult learners and the potential for meeting those needs.

Naisbitt, in defining the "law of the situation," asks the question, "what business are you really in?" And follows with, "If you don't know what business you are in, conceptualize what business it would be useful to think you are in" (Naisbitt, 1982, p. 79). If administrators in higher education are attempting to meet the needs of rural adult learners, then that "business" requires a look at all the options of delivery.

It is clear from a 1985 study that 13 percent of the responding schools in the West use information technologies to reach rural adult learners in off-campus settings (Lewis and Markwood, 1985, p. 5). Their report says, "The ability of colleges to fulfill their outreach commitments and in some cases to survive financially, may depend on how effectively they can use the information technologies to extend the services of the campus. . ." (Lewis and Markwood, 1985, p. 13).

Historical Sketch

The emerging telecommunications educational delivery to off-campus students is sometimes characterized as "enhanced" correspondence study or independent study. It therefore seems appropriate to consider correspondence study as the grandparent of distance education. Moore named Professor Charles Wedemeyer as the

father of American distance education (Moore, 1987, p. 59). He says that Wedemeyer's experiments in developing distance education at the University of Wisconsin in the 1960's were the immediate prototype for the British Open University.

An article by Pittman estimated that 4,500,000 people in 1984 were enrolled in some type of study by correspondence. Pittman comments, "Yet, in spite of nearly a century of experience, millions of satisfied students, and a forward-looking attitude, correspondence study is still dogged by questions about its efficacy and credibility" (Pittman, 1985, pp. 182-212).

In a recent article, Pittman states that collegiate correspondence study in the U. S. is usually dated from the year 1892, when the University of Chicago was established, with a home study department in its Division of Extension (Pittman, 1987, p. 31). Thus the concept of lifelong learning and methods of delivery to adults in their homes has nearly 100 years of history. Is it possible that in the year 2050 telecommunications advocates will be writing and defending its credibility?

It was 1961 when Cyril O. Houle, a leading adult educator, wrote:

> The inquiring minds of the past have produced most of the advances of civilization. Our hopes for the future must rest in large measure on our capacity to increase the number and ability of those who continue all their lives to share in the benefits and

the pleasures of intellectual inquiry. (Houle, 1961, p. 82)

According to a Texas report, the first use of television for educational services happened on January 25, 1933 when the State University of Iowa in Iowa City aired its first instructional telecast ("Instructional Television," 1986, p. 2). The report traces through the 1940's when elementary and secondary schools began using broadcast television for instructional purposes. By 1948 at least eight colleges and universities were producing and using instructional television. The first commercial telecast originated in Detroit in February, 1940. In 1953 the first education television, KUHT, licensed to the University of Houston, went on the air. The U.S. Congress dedicated a specified frequency spectrum for instructional purposes, I.T.F.S., in 1962 and this system was first used by Plainedge Public School System on Long Island in 1972. The Corporation for Public Broadcasting was created in 1967 and is credited with making PBS a reality ("Instructional Television," 1986, p. 2).

In a recent article, Dee Brock, vice president of the PBS Adult Learning Service (ALS), said that the number of students going to college in front of television has risen by 280 percent since 1981. Brock termed the fact that 400,000 students have been in the ALS program over the past five years a, ". . .quiet revolution in higher education" (Marquand, 1987, p. 25). The

article pointed out that in September of 1986, 285 PBS stations were offering a total of 32 courses in collaboration with 1,000 colleges around the country.

Thus, it has been a long evolution to the scene in 1987 when there is speculation that a major part of the information we receive could come directly into our homes via telecommunications.

Selected Telecommunications Systems

On a global scale, Walter Perry was asked by the United Nations University to study the state of the art, as preliminary to considering the use of distance learning, in developing a new program called Global Learning (Perry, 1984, p. 5). The Perry report states, "It is clear that there are two million students (revised upward prior to publication to 2,084,138) studying by distance learning methods in institutions covered so far." At the point of publishing they were waiting for 637 institutions to respond. The study's methodology was to send questionnaires all over the world to institutions " . . .which we had any reason to believe might be involved in distance-learning." Responses totaling 393 were received from 88 countries, including 71 from the United States and 25 from Canadian institutions (Perry, 1984, p. 5).

In Alaska, a satellite-based telecommunications system linking all school districts in the state, has been in place since 1980, according to the Texas report. The Alaska system was a project of

the Northwest Regional Educational Laboratory in Portland, which developed Individualized Study by Technology (IST) to provide instruction in Alaskan classrooms. This multimillion dollar undertaking uses computers, video tapes, audio tapes, and print materials (Simon-McWilliams & Murphy, 1984, pp. 1-2).

In Oregon, at McMinnville's Linfield College, plans were outlined for the use of electronic technology to ". . . improve and expand delivery of classes at off-campus locations throughout Oregon" (Prospectus, 1985). The Linfield plan called for nine courses via an audioconferencing network during the first year; in the second year all classes scheduled by the Division of Continuing Education were to be delivered by the network. Linfield expected the result to be, ". . . reduced instructional cost, standardized course content and assured quality of instruction." The Linfield plan, also assisted by the Northwest Laboratory, features a campus-based lead professor, who conducts the course via audioconferencing, electronic mail, computer conferencing, cable television, and one-way and two-way computer-generated graphics.

An institution with a reputation for innovation in the field of telecommunications is California State University, Chico. Chico State has been involved in distance education with closed circuit television since 1975 but in 1984 added a C-band satellite (Urbanowicz, et al., p. 1). Chico's I.T.F.S. system now serves 16 remote sites in northeastern California. Chico defines I.T.F.S. as

"instructional television for students" a play on the initials.

Moving into the Mountain Plains states, we find several innovations in technological delivery in Colorado, Utah and Arizona, plus a four-state project for the states of Montana, Wyoming, Utah, and Colorado.

At Colorado State University SURGE (State University Resources in Graduate Education) began in the Fall of 1967 to provide graduate education in engineering. Approximately 450 students each semester, at 50 locations, receive videotaped instruction, taped by Colorado State faculty before an on-campus student audience. The courses are taped in one of four available classrooms and the tapes are mailed to the participating sites. The program, which started with broadcast via microwave, switched to videotapes, and now also includes classes from the College of Business and the College of Natural Sciences (Kubly and Snider, 1984, pp. 102, 103).

National Technological University (NTU), based at Colorado State in Fort Collins, provides satellite-only delivery of technical graduate coursework from 21 universities to sites all over the United States (see detailed information about NTU in Appendix B).

Arizona State University (ASU), cited in the Texas report, pioneered the use of telecourses, when in 1958 they began offering courses via public television and ASU cable. Licensed in 1982 to operate I.T.F.S., ASU's course offerings have since grown to 55, studios now number four, and they have 13 receive sites in the state

("Instructional Television," 1986, p. 23).

The State of Utah lists SETOC (State Educational Telecommunications Operations Center) at the University of Utah. SETOC is the administrative system which coordinates the operation and programming of various telecommunications in the state, including EDNET, statewide microwave; KULC (9) and KUED (7), both PBS affiliates; satellite services, receive only; and an I.T.F.S. system which is scheduled to be functional later in 1987. In a report for the academic year, July 1, 1986 to June 30, 1987, total microwave hours were reported at 1,139.5 and total satellite hours were 106.25. Clients of SETOC include higher and public education in addition to federal, state, and local governmental agencies. Sites for EDNET include Cedar City, Richfield, Ephraim, Vernal, Roosevelt, Manila, Orem, Logan, and Ogden with Price and St. George to be added. The system also coordinates the telecourse offerings in Utah which are offered at smaller colleges.

A project titled, "Extending Humanities Courses to Nontraditional Rural Learners in Utah," was reviewed and evaluated as follows:

> A complex electronic delivery system serving nine remote sites has been installed and is operating satisfactorily. . . . In less than two academic terms the level of accomplishment is significant and positive. (Meuter, 1985, p. 9)

This Utah State LearnerNet system uses slow-scan television and

electronic blackboard, and masks the technology to keep it as "transparent as possible." The evaluation says that client/students were, ". . . universal in their praise for the project and the quality of their learning experience" (Meuter, 1985, p.7).

Another evolving Utah State University system, COMNET, implemented in 1984 at seven existing Continuing Education centers in Utah, now serves 13 outreach centers, with additions proposed at two junior colleges, Eastern Utah and Snow College (Seamons, 1985, p. 1). The COMNET system uses two leased telephone circuits with interaction, two-way audio, two-way video, and two-way file services. Four degrees are offered on a two-year rotation basis (Seamons,1985, p. 2).

Three of the seven Mountain Plains states (Colorado, Utah and Wyoming) plus Montana are involved in a venture called Intermountain Community Learning and Information Services (ICLIS) which is supported by a grant from the W. K. Kellogg Foundation and is in partnership with IBM. The ICLIS mission statement is:

> To develop and demonstrate improved ways to provide educational and informational services and resources to people in rural areas through local public libraries. (ICLIS brochure)

The ICLIS project began on Dec. 1, 1985 with four land-grant universities: Colorado State, Montana State, Utah State, and the University of Wyoming. Delivery sites are Craig and Meeker, Colorado; Price and Vernal, Utah; Douglas and Rawlins, Wyoming; and Hamilton

and Libby, Montana. The ICLIS brochure states:

> We live in a changing world. Technology affects all aspects of our lives, especially the shift from a production-manufacturing intensive society to a knowledge-intensive society. . . . To assist rural Americans to meet the challenges of the Information Age, ICLIS becomes an important link between the resources of the Information age and America's rural heartlands. Technology is a means - not an end. This is a guiding principle behind the ICLIS project. (undated)

Medium is Not the Message

Throughout the literature, there appears a general caution about not allowing telecommunications, the medium, to become the message; although it is clear that any technology could be chosen to accomplish any distance learning goals that any educator could desire. Martin N. Chamberlain, assessed the situation, as follows:

> In the long run, the mass media can only supply the delivery systems for the message continuing educators must provide. These educators and the staffs they hire for the programs are the ensurers of quality. Mass media and the new technology associated with them provide continuing educators with mass markets. But without quality programming the gains will be lost. The necessity for quality programming grows with opportunity. What is needed is the willingness to experiment and understand how best to use the opportunity. (Chamberlain,

1980, p. viii)

Dr. Mary Alice White, educator at Columbia University Teachers College in New York, was quoted, "For the last 500 years humans have learned primarily from print. But it was never written in concrete that it was always going to be that way. In the future we may learn primarily from electronic imagery. . ." (Tyner, 1987, p. 21). Dr. White has developed a course for Columbia graduate students on what she calls imagery comprehension, toward a visual literacy. She explained, "There is more than one way to learn, and I think that once you begin exploring a visual medium for expressing ideas, for looking at problems, it's a very different way of looking at them."

Thus, perhaps visual literacy will be added to a designated place in teacher education requirements, along with computer literacy, library literacy, audiovisual aids literacy.

According to the 1986 Texas report ("Instructional Television," 1986, p. 4) "Technology available for use to offer instruction via television is awesome. Technology, however, often induces a tendency to do what is possible rather than what is desireable." The report went on to say that further comparative studies ". . .dwindled to a trickle. . ." when there was a realization that television is no more than a communication device. A quote from Richard E. Clark summed up, "The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievements any more than the truck that delivers our groceries

causes changes in our nutrition" ("Instructional Television,"1986, pp. 27,28).

Another author, Jan Baltzer, concluded that, ". . . if we are committed to serving adults, the use of technology is our future." She suggested we begin, ". . . however gradually . . . to utilize alternative delivery, network to share successes and failures" (Baltzer, 1982, p. 14).

Questions of Evaluation

With the technology in place, administrators and planners in the higher education field continue to sort and sift in an effort to make decisions for the future. The literature contains considerable documentation about the positive educational value of telecommunications and its effectiveness for successful learning. There is also literature on the negative aspects of instructional technology.

A Texas College and University Report cites a landmark study by Chu and Schramm, which was done in 1967 and compiled 207 studies in which television teaching was compared with conventional teaching ("Instructional Television," 1986, p. 5). In 308 of 421 separate comparisons, the authors found no statistically significant differences in student achievement; 67 comparisons showed television instruction to be superior and 50 found conventional instruction better. This Texas report also quotes an extensive review of research done by O'Rourke which spanned the years 1949-1979 and

showed no difference between the learning and performance of students who were instructed by television and those taught traditionally ("Instructional Television," 1986, p. 6).

Peter Dirr, quoted in the Texas report, said that since 1980 both the academic and production quality of telecourses has increased significantly and ". . . today's television courses combine both good television viewing and the best scholarship available in the country" ("Instructional Television," 1986, p. 98).

In a study done by Blackburn and Ging to determine factors that led administrators and faculty to adopt, or not adopt, courses funded by the Annenbery/CPB project, several findings were made (Blackburn and Ging, 1986, p. 14). Adoption of telecourses was more likely to occur when adopters: (a) gave high scores to academic useability, (b) if materials were received through a chain of individuals known to the decision-makers, (c) if the institution had a successful track record in innovation, and (d) when decision-makers believe that adoption can be easily implemented. This study contained implications for the future:

> If the mission of the project is to serve distant learners, new alliances with the experts in this field should be explored. For example, the project could establish a centralized national library for educational video pieces and demonstrate a telecommunications system by which faculty could preview and 'borrow' these resources long distance. (Blackburn and Ging,

1986, p. 17)

Blackburn and Ging also listed institutional mechanisms that make it possible to offer telecourses: (a) presence of a telecourse or media consultant, (b) relationships with cable or PBS station, (c) video equipment for on-campus distribution of programs, (d) budget for software purchase, and (e) creation of "elastic" course numbers that are adaptable to a variety of course descriptions and can accomodate quick inserts of new telecourses into the curriculum.

The questions that need to be raised when evaluating the effectiveness of instructional technologies are addressed by Tate and Kressel (Tate and Kressel, 1983, p. 102). These authors cite the following questions: instructional goals, types of learning intended, sorts of students involved, and the environmental constraints imposed by time, distance, money, and availability of teaching staff.

A model for selecting distance delivery systems has been developed by Sue Spencer (see Appendix C, Spencer Model). She pointed out a ". . . lack of understanding by continuing education providers of the potential of alternative educational delivery methods." After a study that elicited 97 responses from four-year colleges in 19 rural states, she developed a model which attempts to identify the areas in which questions should be asked when selecting an educational delivery method.

In a presentation at the International Conference, "Visions of Higher Education," in Pomona, N. J., Ron Smith said that, ". . . there is

no sensible reason at all for any one institution to become involved in telecommunications for the education of students except that there be clear financial advantage in doing so that cannot be achieved in alternative ways" (Smith, 1986, p. 5). Smith goes on to suggest a main step for success: (a) core courses delivered by television, at least in part, (b) use of course outlines, texts, and readings, (c) participation in group discussions, and (d) tests and supportive written assignments that are tightly coordinated.

In 1982 Jan Baltzer had suggested these questions to ask: who is the target audience, what is the nature of the course content, what is already available, what is the cost, and what kind of programming (Baltzer, 1982, pp. 1-15).

The how-to-evaluate questions assume a positive attempt at initiating a telecommunications delivery system, but there is literature to support negative views also. The Texas report brings up the "resistance issue: why isn't everybody using telecommunications extensively?" ("Instructional Television," 1986, pp. 33, 34). Factors for lack of use include inadequate faculty rewards, policies related to copyright, revision and use of programming, and budgeting practices that are "based on student/faculty ratios which provide no incentives for increased productivity."

Tate and Kressel question whether technologies necessarily make postsecondary programs more available to previously unserved people (Tate and Kressel, 1983, p. 95). They quote a Lewis study that

found, after analyzing 70 telecommunications-based model programs, that most of the learners were white high school graduates between 24-34 years of age, employed more than 35 hours a week, with family incomes of $15,000 to $25,000. These authors go on to suggest that, ". . . it is crucial for institutions to provide opportunities for training, release time, and other incentives that will encourage faculty to produce technology-based learning materials. . ."

Addressing the underserved issue, Carey and Moss assert that, in general terms, new telecommunications technologies offer few opportunities for public broadcasting to extend services because the groups that need information services the most will be unable to afford most of the new technologies, with two exceptions: low power television and teletext. They predict, ". . . teletext may become the only widely-used electronic publishing system in American homes during the late 1980's" (Carey and Moss, 1984, p. 75).

In a partially negative article, titled "Hidden Perils," Grossman says, ". . . most of the dynamic elements in instruction are lost as one proceeds to the static form of delivery [meaning technology]." He then goes on to give a list of faculty considerations that could make a significant difference and says, "In short, instruction will be of high quality to the extent that distance-learning programs and technologically delivered instruction allow the faculty to profess, to achieve the full realization of their professional responsibilities" (Grossman, 1987, p. 10).

Summary

The literature reviewed for this project traces the evolution of the information society to the point in history when the educational use of technology is expanding exponentially. It seems clear that even if no other new technology ever surfaces, colleges and universities have a myriad of options in 1987 if they determine that their mission is to serve the previously underserved or relatively neglected portion of the U.S. population that has chosen to live in nonmetropolitan areas. The variety of choices for technology to reach out and touch these potential learners will continue to confound and confuse and bewilder. Commitment to the concepts of technological delivery systems, when added to financial commitments, can make the difference if administrators decide to proactively plan for the future of higher education.

Naisbitt talks about living in the "time of the parenthesis," the time between eras: ". . . in the time of the parenthesis we have extraordinary leverage and influence - individually, professionally and institutionally - if we can only get a clear sense, a clear conception, a clear vision, of the road ahead" (Naisbitt, 1982, p. 249).

CHAPTER THREE: PROCEDURES

Because the field of educational telecommunications is so broad, it was necessary to limit the scope of this research. Early in the literature search process it was decided to use as a data base the 1985 WICHE study that included information from the seven states which comprise the Mountain Plains. A second rationale for choosing the particular seven-state focus of this study is the researcher's membership in the Mountain Plains Adult Education Association, which provides a vehicle for information-sharing, via a biannual refereed journal and annual conferences.

It was also decided to further limit this project's data search to WICHE study respondents who said they delivered postsecondary coursework via telecommunications to off-campus sites, which can be defined as nonmetropolitan. Permission was granted by WICHE to adapt their copyrighted questionnaire. Raw data shared by WICHE made it possible to determine the individual at each college and university who was most likely to have the requested information. Potential respondents were advised in a cover letter that, "Findings from this research. . . will be mailed to all respondents and should provide information of value to decision-makers. . ." Therefore, this researcher believed that sharing results was a prime purpose for undertaking the project.

Two separate computer searches were initiated to sample the literature on distance education, telecommunications, and information specific to the Mountain Plains states.

In organizing the project, a card file system was established for each institution to be surveyed. Each school was assigned a number and a mailing list was prepared.

Using parts of the WICHE questionnaire, a survey was designed and prepared for mailing to a group of individuals known by the researcher to be professionals in the field of telecommunications and administration of off-campus programs. Participants in pretesting the survey were:

Marsha Bankirer, director, Division of Continuing Education, Colorado State University;

Dr. Ralph F. Meuter, Dean, Continuing Education, California State University, Chico;

Dr. Charles T. Muse, director of Continuing Education, Georgia Southwestern College;

Richard Markwood, senior staff associate, Western Interstate Commission for Higher Education;

Dr. Jack Mauch, Dean, Continuing Education and Summer Sessions, Idaho State University;

Karen Waldal Simpkins, Program Specialist, Idaho State University Continuing Education;

Dr. Shirley A. Reed, associate dean for Learning Resources, Northland Pioneer College, Holbrook, Arizona;

Dr. Phyllis "Teddie" Safman, Division of Continuing Education, University of Utah;

Dr. Paul Kipper, Coordinator of Extension classes, University of Wyoming.

After revisions suggested by the pretest, the final questionnaire was prepared and mailed with a cover letter (see Appendix D) to 64 officials at 49 colleges and universities in the Mountain Plains states. A copy of the questionnaire is included in Appendix E. At the end of a 10-day designated deadline, 14 questionnaires had been returned by mail. A second request to complete the questionnaire was mailed to potential respondents with a copy of a letter (see Appendix A) from WICHE's deputy director.

After the second mailed request for information, followup telephone calls were made to approximately 25 institutions. July 10, approximately one-and-one-half months after the initial mailing, was set as the cut-off date for responses. Responses, either returned by mail or communicated by telephone were received from 41 of the 49 institutions, a percentage return of 83.7 percent.

During the course of reviewing the literature, a model designed for evaluating distance delivery methods was published by Sue Spencer at the University of Montana. Her permission was requested and received to use the model; however, the model was not included with the survey, but is included in Appendix C for information and use by those interested.

After reviewing the responses received, it was decided to exclude from the project tabulations those institutions which were not delivering coursework via telecommunications to off-campus sites and those who

deliver via telecommunications but only deliver to metropolitan sites. Since data from the excluded schools is part of the Mountain Plains information base, it is included in Appendix F.

To summarize, the procedures used appeared to be adequate for the goal of getting a high percentage of returns from a large geographic area. The result was a response rate of over 83 percent.

CHAPTER FOUR: FINDINGS

Since the intent of this research project was to gather information from selected institutions of higher education in the Mountain Plains states concerning their off-campus delivery via telecommunications to nonmetropolitan areas, it was useful to have received responses from 22 participating institutions who are within the parameters of the research. An unexpected addition to the data base are the responses from 19 other institutions that returned information, but fell outside the parameters of the study (see Appendix F, Respondents Excluded). For instance, all NTU students are off-campus and receive all instruction via satellite to their workplace (see Appendix B). The other 18 institutions deliver instruction via telecommunications only in metropolitan areas or deliver no instruction off-campus.

Institutional Information

The 22 colleges and universities which responded showed total enrollment of 248,129 students, as listed by the reference book, Accredited Institutions of Postsecondary Education. Since data returned in the questionnare were incomplete regarding enrollments, a published source was used. In terms of highest degree offered, 11 institutions offer a doctorate, seven offer associate degrees and three offer master's degrees. One institution did not respond to this question. Institutional Information is shown in Table 1, Institutional Information.

Table 1

Institutional Information

	Institution	Enrollment	Highest Degree
AZ	Arizona State University	30,342	D
	Maricopa Community Colleges *	24,909	A
	Northland Pioneer College	1,505	A
	University of Arizona	25,438	D
CO	Colorado Mountain College	966	A
	Colorado State University	18,084	D
	University of Northern Colorado	8,233	D
ID	Boise State University	10,401	M
	North Idaho College	2,235	A
	University of Idaho	8,848	D
NV	University of Nevada, Las Vegas	9,402	D
	University of Nevada, Reno	9,817	D
NM	Eastern New Mexico University	3,190	M
	New Mexico State U. - Las Cruces	12,613	NR
	University of New Mexico **	18,820	D
UT	Salt Lake Community College	NR	A
	University of Utah	25,646	D
	Utah State University	12,571	D
	Weber State College	11,117	M

(table continues)

Table 1 Continued

Institutional Information

	Institution	Enrollment	Highest Degree
WY	Central Wyoming College	900	A
	Laramie County Community College	2,252	A
	University of Wyoming	10,840	D
	TOTAL	248,129	

KEY: NR - No Response

A - Associate Degree

M - Master's Degree

D - Doctorate Degree

Enrollment Data: Accredited Institutions of Postsecondary Education, 1987, American Council on Education, Washington, D. C.

* Seven colleges in group: Glendale, Mesa, Phoenix, Rio Salada, Scottsdale, South Mountain, and Maricopa Technical.

** Includes Gallup, NM

Informational Technologies Used

Although most of the responding institutions are using more than one form of telecommunications to reach off-campus students, the most popular technology is video which is being used by 21 of the 22 responding schools. Five are using video interactively and 16 list their use as noninteractive video. Northland Pioneer College in Arizona plans video delivery in January 1988, which will make video use operational at all 22 responding institutions.The second most popular technology was cable television with 17 responses and third was public television with 16 . A composite of the kinds of technologies being used is included in Table 2, Composite-Technologies Being Used, and a total look at which school is using which technology is included as Table 3, Technologies Used.

The "combination" technologies used by responding institutions were described as follows:

-video telecourses with audio cassette components.

-telephone used for talkback for broadcast instruction.

-microwave (closed circuit) network.

-interactive telephone for all types - all but satellite.

-low power television.

-live instructor/manager three times during an eight-week semester and video tape courier.

-students have access to instructor by toll free telephone; we have interactive courses with another school via microwave system.

Utah State described its COMNET system as follows:

1. VBI (vertical blanking interval) seven second color video with facsimile/audio
2. Audiographic/audio/writing boards; facsimile/computer/ slow-scan video
3. Channel 9 motion video, optell writing tablets audio/facsimile computer (to be up Fall 1987) and electronic interlibrary loan.

Table 2

Composite - Technologies Being Used

Technology	Number of Schools Using	Noninteractive	Interactive
Video	21	16	5
Cable TV	17	17	0
Public Television	16	14	2
Audio	12	4	8
Telephone	11	10	11
Satellite	9	5	4
I.T.F.S.	6	1	5
Public Radio	6	6	0

Table 3

Technologies Used

Key to Technologies Used:

1 - Video	6 - Public Radio
2 - Audio	7 - Telephone
3 - Computer	8 - Satellite
4 - Cable Television	9 - I.T.F.S.
5 - Public Television	10 - Combinations

	Institution	Technology									
		1	2	3	4	5	6	7	8	9	10
AZ	Arizona State U.	N			N		N			I	
	Maricopa Com. Colleges	N	I	I	N		N	N	I		
	Northland Pioneer Col.		I		N				I		
	U. of Arizona	N								I,N	I
CO	Colorado Mountain Col.	N	N	I	N		N		I	N	N
	Colorado State U. *	N	N		N		N			N	
	U. of Northern Colorado	N	I		N		N		I		
ID	Boise State U.	N			N		N				I
	North Idaho Col.	N	N		N		N			I	C
	U. of Idaho	N									
NV	U. of Nevada, Las Vegas	N							I		

(table continues)

Table 3 Continued

Technologies Used

	Institution	Technology									
		1	2	3	4	5	6	7	8	9	10
	U. of Nevada, Reno	N	I	I	N	N	N	I			
NM	Eastern New Mexico U.	I	I		N	I		I		I	C
	New Mexico State U.	N			N	N					
	U. of New Mexico	I	I		N	N	N	I	I,N	I	
UT	Salt Lake Com. Col.	N	N	N		N					
	U. of Utah	I	I	I	N	N	N	I	N		C
	Utah State U.	I	I	I	N	I	N	I	N		C
	Weber State Col.	I			N	N					C
WY	Central Wyoming Col.	N			N	N	N				
	Laramie County Com. Col.	N		N	N						
	U. of Wyoming	N		I				I			

* SURGE

Key to Responses:

I - Interactive

N - Noninteractive

C - Combinations

Extent of Use and Application

Responses of 22 colleges and universities showed that in the Mountain Plains states at least 24,452 students participated in a total of 1,261 courses offered via telecommunications during the past two school years. In other words, an average of over 1,100 students at each of the 22 schools were involved in postsecondary coursework via telecommunications. Total number of students and total number of courses are shown in Table 4, Students Served and Courses Delivered Via Telecommunications, for the 1985-86 and 1986-87 school years. Table 5, Summary by Term, shows a breakdown of students and courses delivered by the 22 responding schools for two academic years.

Table 4

Students Served and Courses Delivered Via Telecommunications

		No. of Students		No. of Courses	
		1985-86	86-87	85-86	86-87
AZ	Arizona State University	1,799	1,774	112	117
	Maricopa Community Colleges	3,000	3,000	65	61
	Northland Pioneer College	257	436	22	30
	University of Arizona	329	314	29	32
CO	Colorado Mountain College	650	921	16	32
	Colorado State University	934	858	96	101
	University of Northern Colorado	52	66	1	2
ID	Boise State University	326	392	33	35
	North Idaho College	NR	301	12	10
	University of Idaho	490	491	59	72
NV	University of Nevada, Las Vegas	21	14	15	9
	University of Nevada, Reno	58	31	2	17
NM	Eastern New Mexico University	966	903	10	13
	New Mexico State University	0	33	0	9
	University of New Mexico	225	445	25	60
UT	Salt Lake Community College	50	36	NR	6
	University of Utah	NR	57	NR	4
	Utah State University *	1,407	3,228	47	90

(table continues)

Table 4 continued

Students Served and Courses Delivered Via Telecommunications

		No. of Students		No. of Courses	
		1985-86	86-87	85-86	86-87
	Weber State College	25	70	1	2
WY	Central Wyoming College	NR	NR	NR	NR
	Laramie County Community Col.	67	54	NR	NR
	University of Wyoming	104	268	5	9
Annual Totals		10,760	13,692	550	711
Two Year Totals		24,452		1,261	

KEY:

NR - No response

* - COMNET

Table 5

Summary by Term- last two academic years

	Fall	Winter	Spring	Summer	Total
No. of students	10,516	1,336	10,766	1,834	24,452
No. of courses	550	41	586	84	1,261

The academic level of coursework offered was in the following categories:

Coursework Level	No. of Institutions
Lower division undergraduate	15
Upper division undergraduate	14
Graduate	14
Professional Continuing Education	10
Adult Continuing Education	10
Vocational Technical	8

Several responding institutions listed more than one level of coursework offered. In the category of "other," coursework was mentioned for incarcerated client, skill education by contract, extension staff service, conference services, GED (General Education Development Test), and non-instructional (meetings).

The curriculum areas which make use of telecommunications and totals of institutions reporting, are as follows:

Curriculum Area	No. of Institutions
Business	16
Computer Science	15
Social Studies	12
Sciences	12
Engineering	10
Education	11
Math	11

English	10
Humanities	10

Other curriculum areas mentioned were: communications, home economics, physical education, allied health sciences, professional certification, and vocational technical electronics. (Note: engineering was not listed as a curriculum choice but 10 schools named engineering as "other".)

Variety of Clients and Communities Served

When asked which special populations their institutions target in any off-campus delivery system, respondents said:

Targeted Population	No. of institutions
Professionals	19
Rural Adults	14
Employed skilled labor	8
Incarcerated	8
Unemployed	7
Handicapped	7
Ethnic groups	5

Ethnic groups designated were: Native American, four; and one each; Black, Hispanic, Spanish-Mexican. Listed in the "other" category as targeted for services were: women, two; allied health personnel, one; military personnel, one; distant undergraduate college students, one; pilots, one; civilian personnel at Nevada Test Site, one. One school replied, "No specifically targeted group."

In categorizing the types of communities served via telecommunications, total responses were:

Type of Community	No. of Institutions
Small city (under 50,000)	17
Rural (non-farm)	17
Rural (farm)	13

In addition, 12 of the responding institutions also serve metropolitan areas, defined as having over 50,000 residents. In the "other" types of communitites listed, three colleges serve prisons, one listed business, one delivers coursework to four military bases, one lists three Indian reservations, and one replied, "mountainous Idaho panhandle."

Operational Costs

A question about operational cost, excluding hardware, during the 1986-87 school year, was the least-answered question. However a clear majority, 14 out of 22 institutions did answer the question. Total costs ranged from $4,920 to $427,380. Table 6, Annual Operating Costs, shows costs as reported from the 14 institutions.

Table 6

Annual Operating Costs (1986-87)

Institution *	Total cost **	No. of Students	No. of Classes
Arizona State U	$427,380	1774	117
Maricopa (7 colleges)	350,133	3,000	61
U of New Mexico	312,000	445	60
U of Arizona	290,057	314	32
U of Idaho	290,000	491	72
Utah State (COMNET)	280,200	3,228	90
Eastern New Mexico	117,102	903	13
New Mexico State	95,000	33	9
U. of Wyoming	71,000	268	9
Colo. Mountain Col.	58,000	921	32
Central Wyoming	14,000	NR	NR
North Idaho Col.	13,000	301	10
Salt Lake Com. Col.	7,000	36	6
Laramie Co. Com.	4,920	54	NR

* Telecommunications systems used by institutions are in Table 3.

** Total costs included administration, professional production staff, faculty salaries, instructional materials, and contract fees, licenses, and leases.

NR - No Response

Faculty Involvement and Incentives

In answer to a question about how many faculty members created courses for delivery via telecommunications during the 1986-87 school term, responding institutions reported a total of 333 faculty members. However, three of the 22 schools were responsible for listing 172 , or 48.7 percent of the total faculty number: Arizona State University, 72 faculty members; Utah State University, 70; University of New Mexico, 30.

A wide range of answers to the types of faculty incentives offered was received. Responses varied from "none" and "certain disincentives actually exist" to "$2,500 per course." One school replied, "None, but the school looks favorably on such activity because the Dean is enamored of telecommunications innovations." A complete list of responses to the faculty incentive question is included in Appendix G.

Evaluation Methods

Every responding institution listed some type of evaluative method for coursework delivery via telecommunications. Twenty listed student evaluation, 12 indicated administrative evaluation, 11 specified faculty evaluations, and one said "outside consultant." Under "other" types of evaluations required, one institution listed a "coordinator evaluation" and another said, "same procedures as on-campus courses, none are required." One school replied that a faculty evaluation was available but not required. Another college

responded that a "system-wide evaluation procedure is being developed for the Fall of 1987." Eight institutions sent evaluation instruments for sharing.

Services Most Needed

When asked to rank the services most needed in telecommunications, a clear majority, 13 schools, agreed that first, second, or third priority should be given to: sharing information, establishing regional information networks, and training faculty and staff. The lowest ranking went to updating and disseminating information which only four schools ranked among their top three priorities. A composite of responses is shown in Table 7, Priority Ranking of Services Most Needed.

Twenty respondents said they favor participation in an information exchange for evaluation of telecommunications delivery. Just one disagreed and one institution was undecided. The followup question about willingness to pay a fee for an information service, was acceptable to 14 officials but was qualified in terms of amount of the fee. Seventeen respondents said they participate in formal or informal telecommunications networks or consortia, while three did not participate. Named most often were NTU, AMCEE, NUTN, ICLIS, and the Pacific Mountain Network.

Table 7

Priority Ranking of Services Most Needed

Services	Priority Ranking					
	1	2	3	4	5	6
Share Information	6	4	3	2	2	5
Update, Disseminate Information	1	1	2	7	6	3
Develop model policy guidelines	1	4	6	2	4	3
Develop model planning guidelines	2	3	2	5	5	3
Train faculty and staff	7	3	3	2	2	3
Establish regional information network	4	5	4	2	1	3

(Note: Read, as follows: six institutions ranked sharing information as number one priority; four ranked sharing as number two priority, etc.)

Future Plans

Institutions, asked to describe their plan for the next five years in the telecommunications field, gave broad responses. Total responses are listed in Appendix H. However, some statewide trends appear to have emerged as significant and are reported here, by state.

Arizona: Arizona State, in the fall of 1987, planned to offer engineering courses "worldwide via videotape and/or satellite." The Maricopa system plans course-sharing with other Arizona community colleges. At Northland Pioneer a microwave system with two-way interactive video is planned for eight sites and also a satellite downlink.

Colorado: No plan seems to be emerging but Colorado State's SURGE plans to expand into other (than engineering) disciplines while UNC says a plan is "in progress." At Colorado Mountain College the plan is to ". . . go with total interactive audio/video and computer conferencing."

Idaho: Boise State University plans expansion throughout the state with an uplink satellite which is to be operational in 1987-88. The University of Idaho plans to install a Ku band satellite uplink and offer more non-engineering courses. Participation in statewide telecommunications efforts is planned by North Idaho College.

Nevada: The University of Nevada, Las Vegas, plans expanded delivery to 24 sites in the state, two universities and five community colleges.

New Mexico: The University of New Mexico plans to continue leadership in forming a statewide consortia for distance education and technology. New Mexico State intends to concentrate on military bases and research labs. And Eastern New Mexico reports development of a multichannel communication system capable of producing information services for eastern New Mexico and western Texas.

Utah: Weber State College plans to attach to other regional networks and do interstate instruction, especially in the allied health professions. Salt Lake Community College plans for downlink satellite capability and possible teleconferencing. Utah State's diversity is reported in other sections of this report but interlibrary loan via telecommunications is the latest plan, probably in conjunction with the ICLIS operation.

Wyoming: Perhaps the most ambitious future plan is at the University of Wyoming where a new campus-wide system will be completed in 1988 and a statewide system is being developed with the goal of "providing education services into every home in Wyoming." Laramie County is anticipating a statewide network while Central Wyoming, with a PBS station, hopes to expand to statewide coverage.

To summarize, there appears to be considerable action in the Mountain Plains states, at least on a statewide basis, with some regional planning stage efforts beginning to emerge.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

This research project gathered information about the use of telecommunications in the delivery of postsecondary coursework to off-campus locations throughout the seven Mountain Plains states. It is this researcher's view that meeting the needs of adult learners who live at a distance from educational opportunities is an important responsibility of higher education and is an urgent need in helping adults cope with the demands of the Information Age society. As Carl Rogers pointed out, the same Chinese character has two meanings: crisis and opportunity (Rogers, 1980, p. 339). Educational telecommunications provide both the crisis and an opportunity for educators to move forward into the 21st century.

Clearly telecommunications, as a vehicle for educational delivery, is neither the message nor an end in itself. Rather telecommunications provides a method for transmitting the information needed. Technology is the means, the vehicle, the visuals selected to supplement print media. In 1977 Fred Harrington commented, ". . . the road to an off-campus diploma is long and lonely" (Harrington, 1977, p. 54). Perhaps in the next five years educators will strive to make the road a little shorter and a little less lonely via telecommunications.

Conclusions

Conclusions of this research are based on responses from 41 of the 49 institutions which received surveys. This return represents a

highly acceptable response rate of 83.7 percent. Of the 41 participants, 22 institutions served adult learners in nonmetropolitan areas via telecommunications, 13 institutions do no telecommunications delivery off-campus, five schools delivered coursework via technology but only in metropolitan areas, and the National Technological University (NTU) at Colorado State, served only off-campus learners via satellite. (A directory of the responding institutions is included as Appendix I.)

Conclusions reached regarding the 22 institutions that fell within the parameters of nonmetropolitan coursework delivery via telecommunications are:

1. With a significant increase in the use of telecommunications, adult educators in the Mountain Plains states can anticipate a trend toward increased use of this method and must prepare to meet the challenge. Data showed that 53.7 percent of the institutions surveyed were now using telecommunications, compared with the 1985 WICHE study that concluded 13 percent of the institutions in the West were using information technologies to reach rural adult learners in off-campus settings.

2. A very small group of potential distance learners in the Mountain Plains states are being served via telecommunications. If it is agreed that one-fourth of the population is rural and there may be 661,630 potential learners in the area, just 3.7 percent were served via telecommunications in the past two years. Administrators of

off-campus programs must address the needs of the market by exploring the feasibility of telecommunications.

3. Since 90.9 percent, or 20 of the 22 responding institutions, expressed interest in an information exchange for evaluating delivery, there is a clearly expressed desire for an exchange system. With 14 institutions also agreeing to pay an appropriate fee for information received, the conclusion is reached that such a system could be partly funded by participating institutions.

4. Further research into the issue of how to involve and motivate faculty to participate in telecommunications delivery is necessary. Only 10 colleges reported using some type of faculty incentive and 8 responding institutions are not offering incentives, even though faculty incentives are discussed throughout the literature as important.

5. Statewide or regional incentives for innovation in the telecommunications field should be initiated by professional adult education groups. Diversity amoung the institutions regarding variety of clients and communities served, leads to the conclusion that colleges are willing to experiment and pilot unique projects, such as delivering courses to prisons, Indian reservations, and small public libraries.

6. Since 20 of the 22 institutions reported use of student evaluations, it is evident that student feedback continues as an important educational goal. The implication for expanded use of

telecommunications, is the need for more sophisticated evaluations, perhaps through increased use of outside consultants.

7. A high priority should be assigned to training faculty and staff, sharing information, and establishing regional information networks in the telecommunications field. This study's report on ranking of services most needed reaffirms the WICHE plan to establish a regional cooperative to coordinate telecommunication efforts on a regional basis.

Recommendations

Recommendations for future research in this field are:

1. In a future study, recommend that the question of the cost of telecommunications systems be expanded to include comparative data on cost-effectiveness.

2. Regarding faculty incentives, a survey of persons currently teaching via telecommunications could provide administrators with data for use in faculty and staff training.

3. Participating Mountain Plains institutions should continue research and self-evaluation of telecommunications systems to expand the information base in the field.

4. If this research is to be replicated, recommend annual updated information from participating colleges and continued pursuit of a system to share the information.

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Appendix A: Jonsen Letter

WICHE Western Interstate Commission for Higher Education
P.O. Drawer P Boulder, Colorado 80302
Telephone (303) 497-0200
Improving Education In The West

May 15, 1987

Marjorie Slotten
ISU Resident Center--Twin Falls
PO Box 815
Twin Falls, ID 83301

Dear Ms. Slotten:

We are pleased to hear that you are doing a follow-up study to the data gathered in the WICHE study, "Instructional Applications of Information Technologies: A survey of Higher Education in the West," and that you have found the survey instrument we developed for that study useful. Events in telecommunications are moving so rapidly that data are outdated at the same time they are essential for informed policy decisions.

WICHE is continuing efforts in concert with several constituent states to form a Western Regional Telecommunications Cooperative that will coordinate telecommunications efforts on a regional basis. We hope that you will share the results of your study with us when they become available.

Good luck with your study, and please contact us if we can be of further assistance.

Best regards,

Richard W. Jonsen
Deputy Director

ALASKA • ARIZONA • CALIFORNIA • COLORADO • HAWAII • IDAHO • MONTANA • NEVADA • NEW MEXICO • OREGON • UTAH • WASHINGTON • WYOMING
Affiliated State: NORTH DAKOTA
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Appendix B: National Technological University

Undeniably unique and the most sophisticated telecommunications institution in the Mountain Plains states is National Technological University (NTU), located in Fort Collins, Colorado. Established in 1984 as a non-profit Colorado corporation, NTU's charter lists it as a private educational corporation. According to the NTU bulletin (1986-1987), "The NTU campuses are located wherever the students are, with telecommunications linkages among the students, faculty, and administrative offices. The University relies upon educational and telecommunication technology to deliver academic programs of the highest quality from the participating universities to the students at their job sites, wherever they are located across the U.S." The specific mission of NTU is to serve the advanced educational needs of graduate engineers and technical professionals and to award degrees at the Master's level. NTU offers Master of Science degrees in five programs: Computer Engineering, Computer Science, Electrical Engineering, Engineering Management, and Manufacturing Systems Engineering.

Delivery of classes from 21 participating universities is via Ku-band satellite, in the 12/14 GHz (gigahertz) band, with seven uplinks at sites capable of transmitting by satellite. Schools without uplinks send videotaped courses to the uplink sites, via overnight mail service, which causes delays in viewing for up to 36 hours. However the 1986-1987 year was one of transition and NTU intends

to move toward all satellite delivery, according to a future plan shared with this researcher.

Participating in the NTU, which graduated its first student in May, are three Mountain Plains universities: University of Arizona, 29 classes offered in 1986-87; Colorado State University, 21 classes; and University of Idaho, two classes.

NTU was a respondent to this research project, but because of its uniqueness, data were not combined with the other colleges and universities. The following information was given in the survey returned by NTU:

Information technologies used by NTU include both interactive and non-interactive: video, audio, computer, cable television, telephone, satellite, and I.T.F.S. During the past two school years (1985-86 and 1986-87) a total of 3,081 students were enrolled in a total of 254 classes at their industrial sites. During the 1986-87 school term, 100 faculty members created courses for delivery.

NTU listed its 1986-87 approximate operational cost, excluding hardware, at $4,362,000 which allocated $1,445,000 for administration; $1,872,000 for instructional materials, and $1,045,000 for contract fees, licenses, and leases.

Answering what types of evaluation methods are used, NTU listed both student and outside consultant evaluations. The institution participates in AMCEE, Association for Media-Based Continuing Education for Engineers. NTU said "yes" to interest in

participating in an information exchange for evaluating telecommunications delivery; but answered "maybe" in response to whether a fee for information received would be acceptable.

In ranking services most needed in telecommunications, NTU said:

1. Train faculty and staff
2. Develop model planning guidelines
3. Develop model policy guidelines
4. Update and disseminate information
5. Establish regional information network
6. Share information.

According to the NTU director of planning and budgets, NTU plans for the next five years include delivering all courses via satellite.

Appendix C: Spencer Model

Selection System Model for Evaluating Alternative Delivery Systems

Educational Delivery System: _____

Instructional Budget/Market Strategies	Student Access	Complexity for Student	Complexity for Provider	
Interactive	Eliminates time constraints	Familiar delivery method	Minimal technical expertise	Low capital investment
Motivates to complete	Eliminates place constraints	Minimal student expertise to use method	Minimal preparation of written materials	Low instructional development cost
Attention holding	Far-reaching	Minimal student equipment required	Minimal staff time for development	No license fees
Self-pacing	Transportable		Minimal instructional development time	No air time or line fees
Aural contact with Instructor			No on-site coordination	No handling charges
Face-to-face contact with instructor				Re-usable program
Visuals				Will reach large market
Personalized instruction				Low delivery costs
Appropriate for goals				
Total +____ of 9	Total +____ of 4	Total +____ of 3	Total +____ of 5	Total +____ of 8

Variables are presented as strengths if held by a delivery system. A plus should be given for each variable held by the delivery system being evaluated. By completing this evaluation for each system, comparisons can be made not only in the totals but in the subtotals for each major component.

Source: Spencer, Sue. (1986, Autumn). A model for selecting distance education delivery systems. Continuum. Washington D.C.: Journal of the National University Continuing Education Association.

Appendix D: Cover Letter to Survey

TELECOMMUNICATIONS IN THE MOUNTAIN PLAINS STATES

May 15, 1987

Dear Respondent:

The enclosed survey asks for information about your institution's use of and evaluation of instructional information technologies (telecommunications) in the distance delivery of post-secondary coursework to off-campus locations. I am asking for about 15 minutes of your time to complete and mail this survey back to me by May 30, 1987.

Findings from this research in the seven Mountain Plains states (map below) will be mailed to all respondents and should provide information of value to decision-makers in the distance delivery telecommunications field.

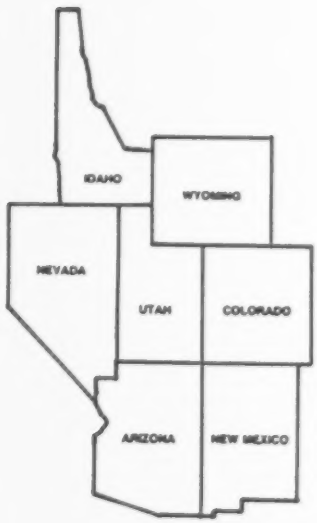
Most respondents were chosen because of previous participation in a WICHE and PMN (Western Interstate Commission for Higher Education and Pacific Mountain Network) study that reported use of one or more telecommunications systems. Permission has been granted to adapt the earlier, copyrighted survey.

Please be sure that the appropriate departments or divisions or administrators are asked to respond. Also please feel free to add information or expand answers, whenever necessary.

I will appreciate your quick response to this request. Please return to me by May 30, 1987 at P. O. Box 815, Twin Falls, ID, 83301 Thank you very much.

Sincerely,

Marjorie H. Slotten, graduate student
Colorado State University, Fort Collins
School of Occupational and Educational
Studies, Master's Candidate in Adult
Education



DEFINITIONS:

1. Off-campus location - any site away from the main campus that is located in a non-metropolitan area with fewer than 50,000 residents.
2. Distance education - describes teaching-learning relationships in which the participants are usually geographically separated and communication is through telecommunications.
3. Instructional information technology or Telecommunications - terms may be used interchangeably and refer to technologies including, but not limited to: video, audio, computer, public television, public radio, telephone, satellite, ITFS, or any combination, either interactive or non-interactive.

Appendix E: Survey Instrument

TELECOMMUNICATIONS IN THE MOUNTAIN PLAINS STATES

I. INSTITUTIONAL INFORMATION

A. Name of Institution_____
B. Mailing Address _____
_____
C. Total enrollment (full-time equivalency)_____
Total off-campus enrollment:
Total number of students_____
Full-time equivalency _____
D. Highest degree granted (circle one):
1. Associate
2. Baccalaureate
3. Master's
4. Doctorate
5. Non-degree
6. Certificate
7. Other (describe)_____
_____

II. INFORMATION TECHNOLOGIES USED (designate all technologies used by your institution to deliver instruction to learners in any off-campus site and label I if interactive or N if non-interactive):

1. Video_____
2. Audio_____
3. Computer_____
4. Cable television _____
5. Public television _____
6. Public radio_____
7. Telephone_____
8. Satellite _____
9. I.T.F.S._____
10. Combination(s) -(describe)
_____
_____

III. EXTENT OF USE AND APPLICATIONS

A. How many off-campus students were served by any form of information technology, by term?

	Fall	Winter	Spring	Summer
1985-86 school year				
1986-87 school year				

B. How many courses were delivered via telecommunications by term?

	Fall	Winter	Spring	Summer
1985-86 school year				
1986-87 school year				

C. What level of coursework is served by your institution's telecommunications system(s)? (Circle all numbers that apply):
1. Lower division undergraduate
2. Upper division undergraduate
3. Graduate
4. Vocational/technical
5. Professional Continuing Education
6. Adult Continuing Education
7. Other (describe)_____
_____

(continued)

D. What curriculum areas make use of telecommunications at your institution? (circle all that apply):

1. Social Studies
2. Sciences
3. Business
4. Humanities
5. Math
6. English
7. Education
8. Computer Science
9. Other (describe)_____

_____

IV. VARIETY OF CLIENTS AND COMMUNITIES

A. Which special populations does your institution target in any off-campus delivery system? (circle all that apply):

1. Professionals
2. Handicapped
3. Incarcerated
4. Employed skilled labor
5. Unemployed
6. Rural adults
7. Ethnic groups (describe)

_____

8. Other_____

_____

B. What type of communities are served via telecommunications? (circle all tht apply):

1. Metropolitan area (over 50,000 population)
2. Small city (under 50,000 population)
3. Rural (non-farm)
4. Rural (farm)
5. Other (describe)_____

V. COSTS

Excluding hardware, please describe your system(s) approximate operational cost in the 1986-87 school year.

Administration _____
Professional production staff _____
Faculty salaries _____
Instructional materials _____
Contract fees, licenses, leases _____

TOTAL _____

VI. FACULTY INVOLVEMENT

A. How many faculty members created courses for delivery via telecommunications during the 1986-87 school term?

_____

B. What type(s) of faculty incentive does your institution offer for creating those courses?_____

_____

(continued)

VII. EVALUATION METHODS

A. What type(s) of evaluative methods does your institution require for telecommunications delivery? (circle all that apply):

1. Administrative
2. Student
3. Faculty
4. Outside Consultant
5. None developed as yet
6. Other (describe) ____

_____

B. If you are willing to share evaluation instruments used by your institution, please enclose copies.

VIII. FUTURE PLANS

A. Does your institution participate in any formal or informal telecommunications network or consortia?
1. Yes 2. No
If yes, please list the name of group(s)_____

_____

B. Is your institution interested in participating in an information exchange for evaluating telecommunications delivery? 1. Yes 2. No
If yes, would a fee for information received be acceptable? 1. Yes 2. No

C. Please rank the services most needed in telecommunications by your institution. (use numbers one through six (1-6) with one being the most important and use each number only once):

Share information _____
Update and disseminate information _____
Develop model policy guidelines _____
Develop model planning guidelines _____
Train faculty and staff _____
Establish regional information network _____

D. In your state, give the name, title, and mailing address of the person (if any) who is responsible for planning and/or review of telecommunications delivery by institutions of higher education:

_____
(name and title)

_____
(mailing address)

(continued)

E. Please describe briefly your institution's plan for the next five years in the telecommunications field.

_____

_____

_____

_____

_____

Thank you very much for your participation. If you wish to receive a summary of findings, please print your name, title, and mailing address below:

PLEASE RETURN BY MAY 30, 1987
to:
Marjorie H. Slotten
P. O. Box 815
Twin Falls, ID 83301

_____
(name)

_____
(title)

_____
(institution)

_____
(mailing address)

Appendix F: Respondents Excluded

Eighteen of the responding institutions reported either that they do not deliver coursework via telecommunications to off-campus sites or they deliver classes only to metropolitan areas, as defined. Although excluded from the major part of this research project, it was decided to include them as part of the data base gathered for the Mountain Plains states.

Institutions responding, but not included in the major portion of this report are, by state:

Arizona: American Graduate School of International Management, Glendale; Devry Institute of Technology, Phoenix; Northern Arizona University, Flagstaff.

Colorado: Aims College, Greeley; Arapahoe Community College, Littleton; Denver Auraria Community College, Denver; Front Range Community College, Westminster; Mesa College, Grand Junction; Metropolitan State College, Denver; Morgan Community College, Fort Morgan.

Idaho: College of Southern Idaho, Twin Falls; Ricks College, Rexburg.

New Mexico: New Mexico State College, Carlsbad.

Utah: Brigham Young University, Provo; University of Phoenix, Salt Lake City.

Wyoming: Casper College, Casper; Eastern Wyoming College, Torrington; Northwest Community College, Powell.

Information shared by the excluded schools, follows, by state, and includes names of contact persons and mailing addresses.

Arizona

American Graduate School of International Management

Does no off-campus telecommunication delivery. Survey returned. Contact: Marshall Greer, Office of Vice President for Academic Affairs, 59th Ave. and Greenway Rd., Glendale, AZ 85306.

Devry Institute of Technology

In telephone conversation reported no coursework delivery via telecommunications. Planning for their nine institutes is done in Chicago. Contact: Reed Hackett, Dean of Academic Affairs, 2149 W. Dunlap, Phoenix, AZ 85016.

Northern Arizona University

In telephone conversation reported no coursework delivery via telecommunications. Contact: John W. Glenn, Dean of Continuing Education and Summer Sessions, Post Office Box 4117, Flagstaff, AZ 86011.

Colorado

Aims College

Delivers coursework to metropolitan area only. Survey returned. Offers associate degrees. Approximately 1,100 off-campus students. Technologies used include video, audio, computer, cable TV, public TV, telephone, and satellite. Delivered three courses in past two school years via telecommunications. In regard to level of coursework, Aims

offers lower division undergraduate, vocational technical, and adult continuing education. Targeted populations include handicapped, employed skilled labor (firemen), unemployed, rural adults, and ethnic groups - "mostly Hispanics." Said, "All programs at Aims make use of telecommunications." Offers "10 percent return" as faculty incentive for creating courses. Participate in PBS telecommunication network. Furture plan: increased use of telecourses and televised or television-assisted education. Services most needed were ranked:

1. Develop model policy guidelines
2. Establish regional information network
3. Develop model planning guidelines
4. Train faculty and staff
5. Share information
6. Update and disseminate information.

Contact: Ken Sauer, Director of Media Services, P.O. Box 69, Greeley, CO 80632.

Arapahoe Community College

Delivers coursework to metropolitan area only. Survey returned. Grants associate degrees. Uses public television, non-interactive, with courses that have been developed by other community colleges, leased or purchased by PBS and then shown locally on educational television. In past two school years have served 802 off-campus students in 25 courses delivered via telecommunications. Special populations targeted include incarcerated, rural adults, students

desiring transfer credit from other schools, and parents with small children who are unable to leave home to attend class. Listed 1986-87 operational cost at total of $33,897, excluding hardware. Services needed were ranked:

1. Train faculty and staff
2. Share information
3. Establish regional information network
4. Update and disseminate information
5. Develop model planning guidelines
6. Develop model policy guidelines.

Future Plan: Look into interactive systems, possibly make some of regular classes available to rural areas via telecommunications. Contact: Richard Voorhees, director, Instructional Resource, 5900 S. Sante Fe. Dr., P.O. Box 9002, Littleton, CO 80160.

Denver Auraria Community College

In telephone conversation reported coursework delivery to metropolitan area only. Contact: David Knauber, Instructional Services, 1068 9th St., Box 250, Denver, CO 80204.

Front Range Community College

In telephone conversaton reported that coursework delivered only to metropolitan area. Telecourses only. Outreach centers in Longmont, Boulder and Larimer Vo. Tech. Contact: Dave Bramer, 3645 W. 112th Ave., Westminster, CO 80030.

Mesa College

Delivers no coursework off campus. Survey returned. Have video and audio, noninteractive. Courses are served by in-classroom play-back and include lower division and upper division undergraduate work, graduate courses (in consortium with other colleges), vocational technical, and professional continuing education. No faculty incentives offered but one faculty member participated in creating part of a course for telecommunications delivery. Listed operational cost in 1986-87 school year at a total of $59,000, excluding hardware. Mesa participates in no networks or consortia for telecommunications. Future plan: Within five years it is hoped that Mesa will be utilizing local cable for course delivery; additionally, it is hoped that some up-linking of vital teleconference programming can be accomplished. In interview reported that library is equipped for possible future satellite. Contact: Dr. Kenton Main, Director of Media and Telecommunications Services, P.O. Box 2647, Grand Junction, CO 81502.

Metropolitan State College

Delivers coursework to metropolitan area only. Survey returned. Use only prepared telecourses. Delivered 15 courses during the 1985-86 and 1986-87 school years to 426 students. Deliver both lower and upper division undergraduate courses. Metro listed an approximate 1986-87 operational cost of $20,673, excluding hardware. Metro offers no faculty incentives but faculty could apply for development grants. Both student and faculty evaluations are

required. In regard to ranking services most needed, Metro ranked train faculty and staff as number one and sharing information as number two. Future plan: Hope to become more involved in cablecasting and interactive cable television learning for long distance. Contact: Gwen Thornton, director of Extended Campus Studies, Box 6, 1006 11th St., Denver, CO 80204.

Morgon Community College

In telephone conversation reported school does no off-campus delivery of coursework at this time. Contact: Patty Everett, Learning Resource Center, 17800 County Road 20, Fort Morgan, CO 80701.

Idaho

College of Southern Idaho

Does no off-campus coursework delivery via telecommunications at this time. Survey returned. Offers associate degrees. Technologies used include noninteractive video, audio, cable television, public television, and interactive computer (computer-aided instruction) in which 50 students were served in Spring , 1987. Interested in participating in an information exchange for evaluating telecommunications delivery. CSI ranked services most needed as:

1. Develop model planning guidelines
2. Share information
3. Update and disseminate information
4. Establish regional information network

5. Train faculty and staff
6. Develop model policy guidelines.

Future plan: Title III grant to connect the Boise State University Simplot-Micron Center to the CSI campus, plus I.T.F.S. to off-campus centers in Burley and Wendell and fiber optics to Hailey. Contact: Dr. Gerald Beck, director, Continuing Education, P.O. Box 1238, Twin Falls, ID 83301.

Ricks College

In telephone conversation reported no coursework delivery via telecommunications. Contact Tom Liau, Library director, Rexburg, ID 83440.

New Mexico

New Mexico State University - Carlsbad

Delivers no coursework off-campus. Survey returned. Expressed interest in participating in information exchange for evaluation of telecommunications delivery. Future plan: hope to be fully operable. Ranked services needed:

1. Develop model planning guidelines
2. Train faculty and staff
3. Establish regional information network
4. Share information
5. Develop model policy guidelines
6. Update and disseminate information

Contact: Shelton W. Marlow, Provost, 1500 University Drive,

Carlsbad, NM 88220.

Utah

Brigham Young University

Delivers no coursework off-campus via telecommunications. Survey returned. Has campus cable system which shows programs (videos, films) which have been purchased along with the rights to show them, to students, faculty, and staff. Contact: Glenda V. Judy, Client relations supervisor, Audiovisual Services, Provo, UT 84602.

University of Phoenix

Survey returned. Does not use any telecommunications for any of its courses in any location: Utah, Colorado, Arizona, and New Mexico. Contact: R. Jan Thurston, 5251 Green St., Salt Lake City, UT 84123.

Wyoming

Casper College

Has not yet delivered any courses via telecommunications off-campus. Survey returned. Offers associate degrees. Future Plan: "We are in the process of developing a system to conduct telecourses beginning in January, 1988: we have most of the hardware in place and will work with Central Wyoming College, Riverton, to recruit and train teachers. We'll be using mostly PBS programs initially." Interested in information exchange. Targets professionals, employed skilled labor, unemployed, rural adults. Ranked services most needed:

1. Train faculty and staff
2. Develop model planning guidelines

3. Develop model policy guidelines
4. Establish regional information network
5. Update and disseminate information
6. Share information.

Contact: Barbara Mueller, Assistant Dean of Continuing Education, 125 College Dr., Casper WY 82601.

Eastern Wyoming college

Uses no telecommunications technology and have no plan in the telecommunications field. Survey returned. Said, "Exclusively utilize adjunct faculty" to deliver coursework to off-campus sites. Target professionals, incarcerated, employed skilled labor, unemployed, and rural adults. Expressed interest in information exchange and said fee would be acceptable. Ranked services needed:

1. Train faculty and staff
2. Update and disseminate information
3. Share information
4. Establish regional information network
5. Develop model planning guidelines
6. Develop model policy guidelines

Contact: Phil Sheller, Assistant Dean of Continuing Education, 3200 West C. St., Torrington, WY 82240.

Northwest Community College

In telephone conversation reported no telecommunications delivery to off-campus sites. Requested findings of survey. Contact:

Jeanne Castberg, Dean of Continuing Education, 861 Lane 11, Rt. 3, Powell, WY 82435.

Appendix G: Faculty Incentives

Responding institutions' answers to the question, "WHAT TYPE(S) OF FACULTY INCENTIVE DOES YOUR INSTITUTION OFFER FOR CREATING TELECOMMUNICATIONS COURSES?" follow:

--- "When the system first began, faculty were given $500-$1,000 in travel, grading assistance, etc. Faculty now are given a percentage of the rental or sales of non-credit video tapes. At present, faculty are not given money for credit courses offered."

--- "A separate development contract ranging from one to three load hours."

--- "$500 per course and $10/unit/student for in-state registrations and $30/unit/student for out-of-state registrations."

--- "Money for professor and department."

--- "We do not produce telecourses {i.e., create); we lease telecourses and hire faculty facilitators."

--- "Participation is recognized in annual evaluation and salary considerations. Faculty are given compensation in terms of credited work load when teaching a video course. Money refunded to the departments as a result of video registrations is often made available to the producing instructor for equipment, books, travel, grad student support, etc. Also departmental compensation and faculty release time."

--- "Adequate administrative and production backup along with generous departmental support for salary and teaching materials ($2,500/course)."

--- "$400/credit hour - instruction; $50/credit hour-course manual; $25 per student over a 40-student base/class."

--- "None, but the school looks favorably on such activity because the Dean is enamored of telecommunications innovations."

--- "Attractive financial rewards; new challenge."

--- "None - part of regular teaching load."

--- "One-eighth salary plus fringe."

--- "Regular salary plus $400 developmental fee, personal encouragement, thank you letter from president, incentive possible for class total over 80 students."

--- "Salary only."

--- "No special incentives now offered: certain disincentives actually exist."

--- "Release time." (mentioned by two respondents)

--- "NA - all prepackaged."

--- "Zero."

--- "None." (mentioned by two respondents)

--- "NA."

One institution gave no response to question.

Appendix H: Five Year Plans

Although highlights from the five-year plans reported are included in the Findings Chapter, total responses are listed here so that other institutions may learn from this data base. The survey question to be answered by the institutions was, "PLEASE DESCRIBE BRIEFLY YOUR INSTITUTION'S PLAN FOR THE NEXT FIVE YEARS IN THE TELECOMMUNICATIONS FIELD." Responses, by state, follow:

Arizona

Arizona State University: "In the Fall of 1987 credit and non-credit courses in engineering produced by ASU will be available worldwide via videotape and/or satellite distribution. In addition, inservice training for teachers will be delivered via I.T.F.S. and cable to area schools. At present the University is operating four I.T.F.S. channels but it plans to expand its channel capacity as soon as possible."

Maricopa Community Colleges: "Expand satellite receive capabilities to include videoconference participation; expand inter and intra-campus video distribution through networking; increase course sharing among district colleges and with other community college districts in Arizona."

Northland Pioneer: "Microwave system for: two-way interactive video to eight sites; double capacity of audio teleconference, slow-scan video for audio teleconference;

computer network; satellite downlink distribution plato from satellite; alternate learning resource centers."

Colorado

Colorado Mountain College: "Go with total interactive audio/video and computer conferencing."

Colorado State University: "Expansion into other disciplines." (SURGE)

University of Northern Colorado: " In progress."

Idaho

Boise State University: "Plan to expand service throughout the state; have purchasesd an AT&T earth Station uplink satellite to be operational in the 1987-88 school year."

North Idaho College: "We will be participating in statewide efforts on telecommunications development, contingent on legislative approval. We will be expanding our use of teleconferencing services, for internal and external applications."

University of Idaho: "Install Ku band satellite uplink, become more actively involved in NTU, increase registrations in existing master's degree programs, offer more non-engineering courses and degrees."

Nevada

University of Nevada-Reno: "In late 1987 an instructional television system for credit and non-credit classes will begin

broadcasting, depending on the UNITE [audio only] teleconferencing system for audio interaction. Planning calls for at least six courses per semester and special courses to be marketed directly to businesses in northern Nevada." (information contained in letter dated 6-16-87 from Larry Gilbert)

University of Nevada-Las Vegas: "Expand to deliver instruction in variety of ways to entire state (24 sites), two universities, five community colleges."

New Mexico

Eastern New Mexico-Portales: "Develop a multichannel communication system capable of producing information services to communitites located in Eastern New Mexico and parts of west Texas."

University of New Mexico: "Expand scope and magnitude of courses delivered via I.T.F.S.; incorporate other technology such as satellite and computers for distance education; continue leadership in forming statewide consortia for distance education and technology."

New Mexico State-Las Cruces: "Concentrate on military bases, research labs and other high densities of populations in high tech; to develop self-supporting programs."

Utah

Salt Lake Community College: "Uncertain future for

telecourses; we now have downlink capabilities, satellite, and possibly will teleconference."

University of Utah: "Plan being developed. In Fall 1987 plan a full master's program in electrical engineering, mechanical engineering, and human resource management to broadcast over Channel 9 from Utah State."

Utah State University: "By Fall 1987, Channel 9 audiographic engineering network and programming (two master's)-vertical blanking interval/microwave network and programming (two master's); electronic inter-library loan system. Our goal is to deliver the greatest variety of services and programming in the most cost-effective manner to the residents of rural Utah and support faculty to the best of our ability."

Weber State College: "Increase the number and nature of courses offered. Next Fall we begin with two new departments: criminal justice and technology. We would be looking to attach ourselves to other regional networks to extend our capabilities and do interstate instruction, especially in Allied Health."

Wyoming

Central Wyoming College: "Since we have the state's only PBS TV station (KCWC-TV) we hope to expand to statewide coverage of college and school telecourse needs through a state-funded telecommunications network, with ourselves as the contracting agency."

Laramie County Community College: "We anticipate involvement in a state-wide network in telecommunications; therefore increasing our capability of receiving as well as sending."

University of Wyoming: "As the only University in Wyoming we have extensive responsibilities for off-campus education statewide. It has been determined that telecommunications will be the means for meeting this expanding off-campus educational need. A new campus-wide telecommunications [system] is now being installed with completion scheduled for the end of 1988. A statewide plan is now being developed for voice, data, and video distribution. Implementation of this plan should occur over the next five years. The ultimate goal is to be able to provide educational services via video and data signals into every home in Wyoming."

Appendix I: Directory of Officials Responding

AZ Arizona State University, Albert K Karnig, Associate Vice President for Academic Affairs, Tempe, 85287.

Maricopa Community Colleges, Janet Whitaker, Associate Dean of Instructional Technology, Rio Salada Community College, 640 N. 1st Ave., Phoenix, 85003.

Northland Pioneer College, Dr. Shirley A. Reed, Associate Dean for Learning Resources, 1200 E. Hermosa Dr., Holbrook, 86025.

University of Arizona, Eileen M. Matz, Director, MICRO-CAMPUS, #76, Box 4, Harville Building, Tucson, 85721.

CO Colorado Mountain College, Vinnie Woerking, Telecommunications Coordinator, Box 10001, Glenwood Springs, 81602.

Colorado State University, Marcia Bankirer, Director, Continuing Education, Rockwell Hall, Fort Collins, 80523.

University of Northern Colorado, Nancy Reddy, Assistant Director, Division of Statewide Programs, Greeley, 80639.

ID Boise State University, Bill Jensen, Director, Continuing Education, 1910 University Boulevard, Boise, 83725.

North Idaho College, Michael J. Miller, Director, Media Resources, 1000 W. Gardner Ave., Coeur d'Alene, 83814.

University of Idaho, Cecil W. Hathaway, Director, Engineering Outreach Department, Moscow, 83843.

NV University of Nevada, Las Vegas, Michael Stowers, 4505 S. Maryland Parkway, Las Vegas, 89154.

University of Nevada, Reno, Larry Gilbert, Associate Director, IMS, Reno, 89557.

NM Eastern New Mexico University, Dr. Everett L. Frost, Vice President for Planning and Analysis, Portales, 88130.

New Mexico State University, Carlton Duke, Director, Professional Educational Telecourses, P.O.Box 3446, Las Cruces, 88003.

University of New Mexico, Dr. Alex A. Sanchez, Vice President, Community and International Programs, #222 Scholes Hall, Albuquerque, 87131.

UT Salt Lake Community College, William Laney, P.O. Box 30808, Salt Lake City, 84130.

University of Utah, Stephen Hess, Director of Media Services; or Douglas Jones, SETOC Coordinator, 205 Talmage, Salt Lake City, 84112.

Utah State University, Dr. R. Alan Seamons, COMNET Director, Logan, 84322-5020.

Weber State College, Linda Wolcott, Director, Instructional Technology Services, Ogden, 84408-2903.

WY Central Wyoming College, Dr. Jon Cobes, Director, LRC, Riverton, 82501.

Laramie County Community College, Michelle Haney, Assistant to the Dean, 1400 E. College Ave., Cheyenne, 82007.

University of Wyoming, Ted Christensen, Manager, Telecommunications Services, 409 Old Main, Laramie, 82071.

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